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ABSTRACT

A project was conducted to identify the pattern of interactions in a sample of 62 vocational classes in 19 representative Kentucky secondary schools and to compare the findings to other studies to ascertain whether these classes displayed the sex bias observed in previous research. Seven observers recorded classroom interactions using the INTERSECT Observation System. Desired results would reveal no sex bias (a proportionate number of interactions for either sex); however, this was not the case. The results of this study were consistent with previous research at the secondary level. A larger proportion of interactions was consistently directed toward males. This was true for all categories of interaction. Females received both less praise and less criticism. Teachers gave very little praise to their students, although most did reach a fairly high level of "acceptance" interactions, particularly with regard to academic work. On a more positive note, criticism occurred even less frequently than praise. In program areas, agriculture stood out with 21 percent more male praise interactions than would be expected, followed by home economics with 9 percent. Gender differences were much smaller for business and other vocational areas. The program areas were also quite close in remediation interactions. (The document includes 43 references. Appendices contain correspondence with local schools and INTERSECT observation instruments.) (KC)

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YEAR END REPORT

Sex Bias/Sex Stereotyping Project

Budget Unit: 4837
Project Number: W23

Relationship of Gender and Teacher/Student Classroom Interaction

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INTRODUCTION

Communication in a classroom between teachers and students is necessary for enhanced learning and positive student attitudes toward schools (Goodlad, 1984). However, many students treat classroom discussion as a spectator sport and do not interact with teachers. Additionally, certain groups of students appear to fall into categories of "interaction-rich" or "interaction-poor" (Sadker & Sadker 1985).

National measures of academic progress (National Assessment of Educational Progress & Scholastic Aptitude Test) support the view that girls and boys are experiencing different environments. The scores of girls in the early grades on standardized tests are generally equal to or better than scores of the boys. However, the scores of boys, by the end of high school, are higher on the national measures. If the most valuable resource in the classroom is the attention of the teacher, then there should be no surprise when boys show greater educational gains (Sadker & Sadker, 1986). Research has shown that male students in a classroom receive as much as 3 times the verbal reinforcement and teacher interaction as female students.

Many teachers are unaware of their sex bias in classroom discussions with students. Students in the same classroom, with the same teacher, studying the same material often experience very different educational environments. Research has shown that approximately one quarter of students are considered to be "interaction-poor,' while a second group typically had one interaction

per teaching session and a third group, 10%, was considered to be "interaction-rich." The "interaction-rich" students participated in more than three times the number of interactions with the teacher than did the other students (Sadker & Sadker, 1986). More interaction rich were males.

The quality as well as the quantity of classroom interaction is also distributed unequally. A teacher's interaction involving precise feedback was more likely to be directed at male students. Teachers infrequently praise or criticize students, but usually simply accept student comments. This high rate of acceptance responses has created classroom environments characterized as "flat, bland, and unexciting" (Sadker & Sadker, 1986).

These bland and biased classrooms provide much cause for concern. Many teachers still remain not only untrained in the skills of interaction, but unaware of the importance of precise reactions, equally delivered. Teachers need appropriate and precise inservice training (Sadker & Sadker, 1986). Bias in the classroom interaction by the teacher inhibits student achievement. The experience of the female student exemplifies this. What other group starts out ahead in reading, writing and math--and twelve years later finds itself behind in all three areas?

Purpose

The purpose of this project was to ascertain the level of teacher-student interaction which exists in Kentucky's secondary vocational education classrooms. Previous research has established a data base for interaction patterns in general education classroom, but no research was found that studied vocational education classes. The findings from this study will be compared with the previous research in an effort to identify similarities or differences which exist in vocational classrooms.

Significance

The findings of this study will have implications for teacher inservice programs as well as for teacher education programs. The results from this study will provide a basis from which classroom interactions between male/female students and secondary vocational education teachers can be compared. Administrators can utilize the information provided by this study in teacher evaluations and classroom improvement models. Few teachers or administrators are aware of the overwhelming discrepancy which exists in teacher/student classroom interactions resulting only from the sex of the student. An increased awareness level of educators regarding this issue will be a major accomplishment of this study. Additionally, teacher education institutions can utilize the findings as a basis for modifying their programs. With a knowledge of teacher practices, teacher educators can work toward the alleviation of sex biased classroom behaviors. Skill in managing a classroom should definitely include training in equitable and appropriate interaction with students.

Research Questions

This research study sought to identify and answer the following:

1) Do differences exist in the interaction levels between secondary vocational education teachers and the male and female students in their classrooms?

2) If differences do exist, in what categories of interaction are they found, i.e., praise, acceptance, remediation, or criticism?

3) What differences in teacher/student interaction exist by type of vocational classroom--agriculture, business, or home economics and how do the categories of interaction vary within the types of vocational classrooms?

Hypotheses

1) A significant difference will be found in the number of teacher interactions with male and female students in secondary vocational education classrooms in Kentucky.

2) A significant difference will be found among the 4 categories of classroom interaction--praise, acceptance, remediation, and criticism.

3) A significant difference will be found in the teacher/student interactions in the three types of vocational classrooms--agriculture, business and home economics. (This difference will be found in both the type and number of interactions.)

Delimitations

1) The data were collected by seven researchers. Even though training and inter-rater reliability scores for these seven were determined, the possibility exists that each individual's perceptions differed.

2) Visitation schedules to the various classrooms varied with the researcher. The time occurring between visits was not the same for all classes. Example: some were scheduled a few days apart; others occurred with two-week intervals.

3) In that the observer represented a "third party" in the classroom, teacher/student behavior might have varied from what would be their normal class setting.

LITERATURE REVIEW

This review of literature on sex differences in teacher/student classroom interaction will focus on the research in the studies conducted at different grade levels from early elementary to the postsecondary levels.

Most of the research on classroom interaction has been at the elementary level. A study that was conducted at the preschool level found that all 15 of the teachers that were observed gave the boys more attention and the boys received both verbal and physical awards. They also were given more directions and were twice as likely to get individual instructions as the girls (Serbin & O'Leary, 1975).

Sadker and Sadker (1984) concurred with other studies that were done in the 1960s and 1970s that have indicated male students receive more teacher attention in terms of both praise and criticism.

Elementary schools do not have a subject called Male Role Development or How To Be a Girl. Yet in early elementary grades the students learn their sex roles through a "hidden curriculum" that is replete with incidental learnings. Teachers are unaware that they are contributing to the hidden curriculum by rewarding or punishing students for certain types of behavior. Therefore, the hidden curriculum consists of the things that children learn and not from their textbooks, but actually living in and experiencing the process of schooling (Sadker, M. & Sadker, D., 1973).

In reviewing this area of research, it should be kept in mind that teacher perceptions and the act of teaching itself, may be key ingredients to the source of sex bias. Classroom interaction has been shown to be a viable area of consideration. A review of the literature on sex bias in elementary/secondary and postsecondary classroom interaction has uncovered some consistent teaching patterns which transmit sexist messages and add strength to the belief that the classroom teacher, consciously or unconsciously, may stereotype children, regardless of the sex or race of the teacher.

Classroom Interaction Research

Elementary Findings

The questions of which there has been much conjecture are about when and how sex-role stereotypes develop. According to Serbin and O'Leary's (1975) study it starts in nursery school. Teachers were found to act and react in different ways to boys and girls. They subtly encourage behavioral patterns that will be reinforced continually as they progress through school. They also reported that elementary teachers were more likely to provide extended directions to their male students in order for those students to complete tasks independently. When the teachers helped the female students they tended to do the tasks for them rather than giving the type of instruction that would have allowed for independent work.

Goodlad (1984) has shown that when students participate in classroom discussion they hold more positive attitudes toward school,

and that positive attitudes enhance learning. In a study conducted by Sadker and Sadker (1986), it was found that male students were involved in more interactions than females at all three grade levels (4th, 6th & 8th), and in all subjects. The sex and/or race of the teacher did not matter; the pattern remained the same. Female students received less attention from teachers.

In terms of grading, Brophy and Good (1973) agree with other studies that girls get better grades and achieve more than boys, especially in the early grades, in reading and verbal skills. According to Frazier and Sadker (1973) elementary boys are quite unsuccessful when it comes to winning good grades. When girls and boys have similar IQ, the girls are more likely to receive higher grades than boys. Also, girls who do equally as well as boys on achievement tests get higher grades in school. Two-thirds of all grade repeaters throughout school are boys. The explanation that (boys are biologically less able to adapt to school), is refuted by cross-cultural data from other countries showing that the same sex differences exist both in the quantity and quality of teacher praise and criticism directed to students when verbally evaluating written academic work (Dweck, Davidson, Nelson & Enna, 1978; Spaulding, 1963).

The extensive series of classroom observational studies by Dweck and her colleagues found that there are sex differences in a pattern of behavior called "learned helplessness." Learned helplessness exists where one feels doomed to failure or where failure is perceived as insurmountable. Students who chronically fail in

school do so because they have learned to explain or attribute their failure to factors beyond their control, for example, lack of intellectual ability or sense of incompetence. Females, in particular, seem to be more likely than males to exhibit learned helplessness. Girls are more prone to blame poor performance on a lack of ability rather than a lack of effort. They are also "more likely to show decreased persistence or impaired performance following failure, the threat of failure or increased evaluative pressure." (Dweck et al., 1978).

While the research is far from conclusive, Sadker and Sadker (1984) noted that some studies suggest that teachers' evaluative feedback regarding the intellectual quality of academic work may be a factor in causing sex differences with students who have learned helplessness.

Dweck and her associates (1978) observed fourth and fifth grade classrooms and found that approximately 90 percent of the praise to boys focused on the intellectual quality of their academic work. In contrast for the girls, only 80 percent received similar praise for intellectual competence. The remaining 20% of the praise girls received was focused on neatness and for papers following the rules of form. The sex differences are even more striking in terms of work-related criticism. In the same classrooms, approximately half of the work-related criticism boys received was for intellectual inadequacy and half the time for messiness and incorrect form. On the

other hand, almost 90 percent of teacher criticism to girls dealt with intellectual inadequacy, girls were seldom criticized for neatness and violations of the rules of form. A similar pattern emerged from a study by Bossert (1981) in which he found that boys received less task-relevant feedback, fewer criticisms on work quality, and more praise for intellectual competence. Similarly, a study conducted by Spaulding (1963) involving 21 fourth and sixth grade classes; the males received more criticism in the areas of total blame and disapproval, but this was largely for inappropriate conduct. Females received almost twice as much teacher disapproval as did boys, in the areas of disapproval for lack of knowledge or skill.

Several research studies have shown that male students receive more teacher disapproval contacts directed at classroom misbehavior, and that boys are reprimanded more harshly as well as more often (Jackson & Lahaderne, 1967; Meyer & Thompson, 1963; Lippit & Gold, 1959). Sadker and Sadker (1984) suggest a possible explanation of sex differential patterns of classroom management is socialization patterns cause boys to misbehave more in schools and, they consequently are deserving of more negative teacher attention.

So even when both girls and boys are exhibiting inappropriate behavior, boys are punished more frequently through a loud and public reprimand. When the girls were reprimanded they did it quickly and quietly in a way that other members of the class could not hear (Serbin, O'Leary, Kent, Tonick, 1973).

Sadker & Sadker (1984) noted that an interesting pattern emerged from comments teachers make about students in interviews. These comments indicate far more personal involvement with male than with female students. Boys also received more negative comments than girls in the areas of sloppy work, not trying hard enough, and classroom misbehavior (Jackson, Silberman & Wolfson, 1969).

Since the passage of Title IX of the Education Amendments of 1972, it has been against the law to separate students on the basis of sex in courses and extracurricular activities. However, sex segregation remains in the classroom, particularly at the elementary and middle school levels (Maccoby & Jacklin, 1974). Sometimes teachers create this segregation by categorizing students on the basis of sex by forming boy and girl lines, teams for contests, and groups for class assignments (Frazier & Sadker, 1973). In a study conducted by Sadker and Sadker (1986) they found that sex segregation may be part of the problem of why males capture more and better teacher attention. Another explanation is that boys are eight times as likely as girls to call out and therefore demand a teacher's attention. According to Lockheed, Finkelstein, and Harris (1978) male students are assigned more leadership roles in the classroom by the teacher which also may influence peer groups. Sadker and Sadker (1984) noted that children tend to self select into same sex peer group even when teacher interference does not take place. Ten-to-twelve year old students sorted themselves into gender-segregated groups whenever the opportunity arose (Clement & Eisenhart, 1979). Sheridan (1978) discovered that teachers are not always aware of their discrimination.

He found that 85.5% of the teachers believed they did not assign duties or activities on the basis of sex. However, their students, especially the girls, perceived more stereotyping of activities relative to their individual sex. This tendency for sex stereotyping in activities increased with grade level. Classroom interactions involving precise student feedback were more likely to be directed to male students (Sadker & Sadker, 1986).

Junior High/Secondary Findings

Research in this area is not as extensive as that conducted at the elementary level. Sikes, (1971) in a study at the junior high school level showed that boys received more academic contacts and they were asked more direct questions; more open-ended questions; and more complex and abstract, higher order questions than were girls. In a similar study conducted at the secondary level boys were asked more direct questions and more open-ended questions; they received more teacher initiated contacts and more total positive teacher-student contacts (Jones 1971).

Another study by Good, Sikes, and Brophy (1973) clearly found that male and female teachers treat male and female students similarly. This implies that the two sexes are not treated the same way, since important student sex differences appear regularly. However, the present data has shown that the presence of male teachers does not matter. The same kind of sex differences have been repeatedly demonstrated to exist in classes taught by male teachers.

The data also found that high-achieving males, relative to other students, received the most attention; and the low-achieving males, relative to other students, received the poorest contact patterns with both male and female teachers.

Ricks (1973) conducted a survey of 60 secondary teachers and found that the data revealed that teacher perceptions and attitudes toward sex roles are traditional. The data also revealed that teachers tend to perceive boys as active and girls as passive and tend to feel that boys and girls expect differential treatment along traditional lines. This study also suggested that both male and female teachers have a preference for maleness.

Postsecondary Findings

The research pertaining to sex bias in teacher-student classroom interaction at the postsecondary level indicates that more active teacher attention continues to be directed toward male students even at this level (Karp & Yoels, 1976; Parker, 1975; Sternglanz & Lyberger-Ficek, 1977). Thomas (1983) in her research found that female students had fewer interactions than expected and that male students had more interactions with their teachers than expected. As the academic year progresses this inequity in favor of males tends to increase. Thomas also found that there is approximately one-third less teacher-student classroom interaction at the postsecondary level than at the elementary-secondary levels; and that students self-segregate on the basis of gender to a high degree in their choice of classroom seating.

Not only is there less classroom interaction at the postsecondary level, but four or five students account for over 50% of the total classroom interaction in postsecondary classrooms (Karp & Yoels, 1976). Sadker and Sadker (1986) from their observations of college classrooms reported that the overall amount of interactions decreased and that the number of silent students increased. In comparison to an elementary study in fourth, sixth, and eighth grade classes, 25% of the students were silent; in college classes this increased to 50%. The "okay" classroom was very prevalent at the postsecondary level. There were more interactions of acceptance (boring) than praise, criticism, and remediation combined. According to Karp and Yoels (1976) the avoidance of direct personal confrontation between teacher and student is a typical pattern in college classrooms. In fact their findings indicate that postsecondary teachers rarely call on specific students, but tend to direct questions to the whole class.

In Long's (1986) study the typical classroom had one interaction per minute, with males receiving more interactions than expected and females receiving fewer interactions than expected. Also approximately 25% of all interactions came from the salient students who were just 10% of the class. Forty-five percent of the students remain silent; the other 45% of the students interact with the instructor one or two times. Descriptive statistics indicate that salient students are more often males and that silent students are usually females.

Sadker and Sadker (1981) reported that in a study of 24 leading teacher education college texts, revealed that twenty-three of the texts analyzed gave less than one percent of the space to the issue of sexism. One-third of the texts did not mention the issue of sexism at all. The math and science texts are most guilty of this oversight. These are the areas where girls are most likely to have achievement difficulties. Not a single text provided future teachers with instructional strategies to counteract sexism in the classroom. In a disturbing note Long (1986) noted that only 62 words are devoted to the subheading "Eliminating Sexual Bias" in a newly published text on middle school and secondary teaching methods. The authors state, "Your own good judgment should be sufficient to guide you in this aspect of your teaching" (Clark & Starr, 1986, p. 339). Long strongly disagreed with that statement. She stated, "Teaching is an active and intentional process; teachers become aware of differences in the way they interact with male and females students, and when they receive appropriate training, they become more equitable and effective in the way they instruct all students" (Long, 1986, p. 96).

Since 1972 with the passage of Title IX, there has been greater equity in the application of high school grades as a standard for postsecondary admission. Women's gains in access to higher education and their progress can be documented in terms of the number receiving college degrees each year (Hall & Sandler, 1982). Other studies indicate that women are admitted less often to colleges and universities even though they have achieved the same academic standing

as men (Astin, Harway, & McNamara, 1976; Walster, Cleary, & Clifford, 1976). It has been proven in some studies that the women who do attend college continue to earn higher grades than their males counterparts (Bayer, Drew, Astin, Boruch, & Creager, 1970; Davis, 1964).

Boersman and his associates (1981) did not find praise to make a difference since very little was lauded out by either the male or female professors. Three research studies conducted in the mid-seventies indicated that male faculty tended to affirm students of their own sex more than female students and often perceived female students primarily as sexual beings who were less capable and serious than male students (Heyman, 1977; Hochschild, 1975; Tidball, 1976). College teachers are more likely to devalue academic work performed by female students (Shapiro, 1980) and seldom refer to or expand on women's ideas and contributions (Karp & Yoels, 1976). Another postsecondary study suggests that women students are more likely to doubt their abilities and attribute their success to hard work or luck to skill and competence (Erkut, 1979).

PROCEDURES

This section of the report includes a description of the research procedures, including: population and sample, a description of interaction measures, data collection procedures, and data analysis techniques.

Population and Sample

The population under investigation included all secondary vocational education classes in Kentucky. Based on the actual numbers of classes by program area, it was determined that the sample should be comprised of approximately 20 percent + Home Economics classes, 20 percent - Agriculture classes, 40 percent Business classes, and 20 percent Other Vocational Education classes.

The final list of participating classrooms was derived through the following procedures:

1) The state was divided into four multi-county regions.

2) All high schools in each region were identified.

3) All high schools in each region were sorted into thirds, by student population.

4) Five schools per region - 2 large, 2 medium, and 1 small - were randomly selected.

5) The selected schools were checked in regard to programs offered and student population mix (male/female).

6) Schools that did not meet criteria of gender-mixed classes were dropped from the study and another random selection was made to replace that school.

7) Twenty schools were eventually selected.

8) Letters, in which the project was described, were sent to the school superintendents and their participation was requested. (See Appendix)

9) Nineteen of the 20 superintendents agreed to participate, and designated a contact person for the research staff.

10) A form was completed for each teacher selected which included class name, time taught, and male/female mix of students.

11) These forms were analyzed and a final selection of 62 classrooms was made.

12) The 62 classrooms were divided among the seven observers: Helen Harrah, Ron Hickey, Larry Kelsch, Ron Powell, and Doug Smith of the University of Kentucky; Marsha Roberts of the University of Louisville; and Carrol Groppel of Murray State University.

Description of Interaction Measures

The interaction measures and observation techniques utilized in this research were originally developed through Project INTERSECT (The Network, Inc., 1981). The thrust of this research was to measure interaction patterns and identify bias or inequity which might occur in the way teachers interact with male and female students.

The INTERSECT Observation System is comprised of three instruments. One part includes classroom data such as grade level, subject, gender mix of the classroom. The second section includes 17 categories on which the observers record the type of interaction as it occurs, the sex of the student, and whether the interaction was academic or conduct related. The third section provides an opportunity for the observer to record notes and comments that could provide a more detailed description of he classroom situation at the time of the interaction.

The INTERSECT SYSTEM of analyzing classroom interaction resulted in a number of interaction scores ranging from Praise to

Criticism of both the academic performance and the classroom conduct of the students. The following descriptions of the interaction variables were cited by Thomas (1983, pp. 11-12):

"1. Praise - a teacher's response to student characteristics or behavior that explicitly indicates a positive reaction beyond acceptance. Both the word choice of the teacher's comment and the intonation of the teacher's voice determine a praise comment. Examples would include 'Excellent!' or 'Okay!!'

2. Acceptance - a verbal comment and/or nonverbal expression used by the teacher that implicitly or explicitly indicates the appropriateness or correctness of students' characteristics or behaviors. Examples would include 'right,' 'yes,' or 'okay' stated without strong or enthusiastic intonation.

3. Remediation - teacher response to student characteristics or behavior that implicitly indicates lack of acceptance and/or suggests alternatives. Such a remark may suggest corrective action for student performance or behavior. The comment is not an explicit negative evaluation. Examples would include 'Please sit up straight' or 'State your explanation again.'

4. Criticism - a teacher response to student characteristics or behavior that explicitly indicates negative teacher evaluation and strong disapproval. These are not merely corrective, such as 'Raise your hand,' but explicitly negative as the result of intense, harsh intonation or negative content. Examples would include 'That's a bad job' or 'You will not be allowed to come late to class.'

5. Intellectual Content - a teacher's verbal or nonverbal response to the academic content of a student's performance.

6. Conduct Content - a teacher's verbal or nonverbal response to student classroom deportment."

In addition to reporting findings for each of the above six measures, the first four teacher interactions with students were further analyzed as to whether they were, e.g., praise of academic performance (5. above) or praise of classroom conduct (6. above).

In that classes were rarely, if ever, a 50-50 mix between males and females, a system had to be devised to adjust for the gender balance of the class. The techniques devised to adjust for the uneven distribution of males and females in the classroom was the calculation of a measure called the Coefficient of Distribution. The following examples of how this coefficient is derived was taken from a National Institute of Education research report on classroom interaction submitted by The Network, Inc., the group which markets the INTERSECT SYSTEM.

To determine the distribution of intellectual criticism between males and females in one classroom, these steps were followed:

1. Count the total number of students in the class, for examples, 25 students.

2. Count the total number of males present, then the number of females--for example, 10 males and 15 females.

3. Divide the total number of males by the total number of students; then divide the total number of females by the total number of students. This will yield the expected percentage of interactions for each sex; for example, 10/25 = 40% (expected contact for males), 15/25 = 60% (expected contact for females).

4. Count the total number of contacts for all students in the category being examined; for example, the teacher criticized students 10 times.

5. Count the total number of times teacher criticism was directed at females; then count the total number of times teacher criticism was directed at males; for example, the teacher criticized males five times and females five times.

6. Divide the number of criticisms for males by the total number of contacts for all students; then divide the number of criticisms for females by the total number of contacts for all students. This will yield the actual percentage of interaction for each sex; for example, 5/10 = 50% (actual criticism for males), 5/10 = 50% (actual criticism for females).

7. Compare the results in step 3 (the expected percentage) with the results in step 6 (the actual percentage) by subtraction. The difference between the two is called the coefficient of distribution. If the coefficient of distribution is a positive percentage, that sex is getting more attention than expected. If the coefficient of equity is negative percentage, that sex is receiving less attention than expected.

Example:

50% actual female criticism

-60% expected female criticism

-10% less female criticism than expected given the number of females in the class

50% actual male criticism

-40% expected male criticism

+10% more male criticism than expected given the number of males in the class.

The previous mathematical process enables the researcher to calculate the distribution coefficients for each of the dependent variables.

Observer Training

The seven classroom observers previously identified attended an intensive, two-day training session in Washington, D.C. The training was conducted by David and Myra Sadker, the researchers who have been most instrumental in the development and use of the INTERSECT Observation System. Training included first studying the 50-page INTERSECT Observer's Manual. This was done prior to arriving in Washington. Upon arrival, the Sadkers reviewed the system with the observers; this was followed by practice coding utilizing films and videotapes. The practice coding was continued until the observers had achieved an interrater reliability of .80 or higher.

Data Collection

During February, March, and early April, 1988, visits were completed to the 62 vocational education classrooms selected for participation in the study. Four sample groups were selected for participation, including: Business and Office, Agriculture, Home Economics, and an Other category which included secondary courses not fitting into the first three categories. Three visits were made to

most classes. However, in a very few instances, three visits weren't completed, e.g., having to drive to Owensboro to observe one class which had been rescheduled due to a teacher's change in class schedule. Even with these few exceptions, more classroom observations were made than the 60 x 3 projected in our plans. The observers followed the procedures learned in their training to record the classroom interactions as they occurred.

Data Analysis

During early May, the data were prepared for entry into U.K.'s computer system. Throughout the rest of May and most of June, the interaction data were keyed into the system. Over 13,000 lines of data were entered. The data entry was much more extensive than anticipated.

A computer programmer was employed to guide the data entry and to begin writing the extensive programs necessary to process the data. The plan for the initial data analysis was to generate output which could be analyzed in relation to the results of previous research utilizing, the "INTERSECT SYSTEM." Previous studies dealing with elementary/secondary and postsecondary classrooms revealed more interactions than would be expected with male students. This research was directed at ascertaining whether this same interaction pattern existed in secondary, vocational education classes.

Nearly 11,000 individual interactions were recorded.

FINDINGS

The previous sections of this report have included an introduction to the study; a review of the literature, including reference to the fact that previous research overwhelmingly pointed to an inequity in teacher/student interaction patterns by sex; and a description of the procedures and measures utilized in the gathering and analyzing of data.

Presented in this section is a discussion of the results obtained from analysis of the data collected from Kentucky's Vocational Education classrooms. Table One provides a breakdown of the number of classes observed by program area. Table Two is a summary of the total number of classroom interactions by program area, including the overall Coefficient of Distribution scores. This coefficient is a measure of the extent to which interactions are inequitable and is presented as a percentage. A positive percentage for one sex is always offset by a negative for the other sex. Thus, a value of 10.0 indicates 10 percent more interaction than expected by chance and a -10.0 indicates 10 percent less than would be expected. Tables 3-10 contain findings by type of interaction and whether the interaction was related to the student's academic performance or to his/her conduct.

Sixty-two teachers were involved in the study. One teacher taught 2 classes of Consumer Economics (Business) and 1 class of Consumer Education (Home Ec) and therefore appears twice in Table One.

Table 1

Distribution of Classes Observed by Program Area

Voc. Ed. Area	Number of Teachers	Number of Class Class Sessions Observed
Home Economics	14 (22%)	40
Agriculture	9 (14%)	26
Business	31 (49%)	91
Voc Ed (Other)	9 (14%)	25
Total	63	182

All other teachers taught within a single Vocational Education area. Most teachers were observed three times, resulting in a total of 182 observations.

The random selection procedures did not result in the desired 20, 20, 40, 20 percent distribution by program area. There were more Business and less Agriculture than desired.

Included in Table 2 are data relative to the total number of classroom interactions, regardless of the type of interaction. The average number of interactions was 60, with some variation from one program area to another. This resulted in the recording of nearly 11,000 individual interactions. Regardless of program areas, teacher interaction with males was greater than would be expected by the

Table 2

Teacher-Student Total Interactions in the

Secondary Vocational Education Classroom

Voc Ed Area	Number of Classrooms	Mean Interactions Per Classroom	Coefficient of Distribution	
			Male %	Female %
Home Ec	40 (100%)	55	7.4	-7.4
Agriculture	26 (100%)	64	2.6	-2.6
Business	91 (100%)	63	7.1	-7.1
Voc Ed Other	25 (100%)	55	5.5	-5.5
Total	182 (100%)	60	6.3	-6.3

proportion of males in the classroom. This finding was consistent with previous research and will also be apparent in the remaining tables which examine the interactions by type of interaction and by gender.

The first interaction type investigated was the extent to which teachers praised the academic performance of their students (Table 3). In 83 classroom observations (46 percent), teachers praised their students academic performance. However, the average number of praise interactions was only three per class session. Note the disproportion of male/female praise interactions, particularly in Agriculture.

Table 3

Teacher Praise of Student Work (Intellectual Content) by Program Area

Voc Ed Area	Number of Classrooms	Mean Praise of Intellect Interactions per Classroom	Coeff. of Dist. Male%	Female%
Home Ec	14 (35%)	2	8.7	-8.7
Agriculture	14 (54%)	3	20.7	-20.7
Business	41 (45%)	4	3.1	-3.1
Voc Ed Other	14 (56%)	3	2.2	-2.2
Total	83 (46%)	3	6.8	-6.8

Praise occurred in a larger proportion of Agriculture and Other Vocational Education classes and least frequently in Home Economics.

Acceptance responses by the teachers occurred in virtually every classroom session observed (181 of 182). There were also considerably more acceptance responses than Praise, with an average of 33 versus three. The disparity between male and female students was again evident. (Table 4).

Table 4

Teacher Acceptance of Student Work

by Program Area

Voc Ed Area	Number of Classrooms	Mean Acceptance of Intellect Interactions per Classroom	Coeff. of Distribution	
			Male%	Female%
Home Ec	40 (100%)	28	4.0	-4.0
Agriculture	26 (100%)	37	4.3	-4.3
Business	90 (99%)	34	6.9	-6.9
Voc Ed Other	25 (100%)	31	9.1	-9.1
Total	181 (99%)	33	6.2	-6.2

The disparity of remediation interactions was somewhat less, but still present. These data appear in Table 5. Remediation should not be considered a negative interaction. It can be constructive and positive. Most remediation occurred in Business classes, least in Agriculture. Sex bias was again present.

Table 5

Teacher Remediation of Student Work

by Program Area

Voc Ed Area	Number of Classrooms	Mean Remediation of Intellect Interactions per Classroom	Coeff. of Dist. Male %	Female %
Home Ec	39 (98%)	16	5.4	-5.4
Agriculture	26 (100%)	15	4.0	-4.0
Business	89 (98%)	20	6.5	-6.5
Voc Ed Other	24 (96%)	16	3.4	-3.4
Total	178 (98%)	18	5.5	-5.5

Table 6

Teacher Criticism of Student Work

by Program Area

Voc Ed Area	Number of Classrooms	Mean Criticism of Intellect Interactions per Classroom	Coeff. of Dist. Male %	Female %
Home Ec	16 (40%)	2	4.2	-4.2
Agriculture	11 (42%)	2	11.0	-11.0
Business	37 (41%)	4	16.0	-16.0
Voc Ed Other	6 (24%)	2	17.7	-17.7
Total	70 (38%)	3	12.6	-12.6

Criticism, on the other hand, does denote a negative response by the teacher. These data are presented in Table 6. As was the case with Praise, few criticisms were observed. Academic criticism was observed in only 38 percent of the classes, with an average of 3 occurrences per class. Again, there is a large gap in the Coefficient of Distribution. The negative as well as the positive interactions were directed more often at the male members of the class.

Table 7

Teacher Praise of Student Conduct

by Program Area

Voc Ed Area	Number of Classrooms	Mean Praise of Conduct Interactions per Class	Coeff. of Dist. Male %	Female%
Home Ec	1 (3%)	1	-41.7	41.7
Agriculture	0 (0%)	-	-	-
Business	1 (1%)	1	43.5	-43.5
Voc Ed Other	0 (0%)	-	-	-
Total	2 (1%)	1	.9	-.9

Presented in Tables 7-10 are data relative to interactions dealing with student conduct. Analysis of the Coefficient of Distribution scores must be done with caution due to the small number of conduct interactions. However, these data are being presented for descriptive purposes to display just how few Praise interactions occurred.

Table 8

Teacher Acceptance of Conduct

by Program Area

Voc Ed Area	Number of Classrooms	Mean Acceptance of Interactions per Class	Coeff. of Dist. Male %	Female %
Home Ec	9 (23%)	1	25.1	-25.1
Agriculture	0 (0%)	-	-	-
Business	13 (14%)	2	-4.9	4.9
Voc Ed Other	5 (20%)	3	-27.8	27.8
Total	27 (15%)	2	.9	-.9

Only one percent of the classrooms observed (2 classes) were judged as having a praise of conduct occurring. One female's conduct was praised in a Home Economics class and one male was praised in a Business Class.

There were also very few Acceptance responses to student conduct (Table 8). Most of these acceptance responses were directed at females; however, the numbers were again too small to allow analysis. The findings presented in Tables 7-8 were consistent with previous research utilizing the INTERSECT SYSTEM.

A larger proportion of classes were reported to have had remediation of conduct occur (70 or 38%). These figures are reported in Table 9. An average of four remediations occurred in each of these classes with males receiving a much larger percentage of the remediations.

Table 9

Teacher Remediation of Conduct Interactions

by Program Area

Voc Ed Area	Number of Classrooms	Mean Remediation of Conduct Interactions per Classroom	Coeff. of Dist. Male %	Female %
Home Ec	18 (45%)	3	13.8	-13.8
Agriculture	9 (35%)	2	20.1	-20.1
Business	33 (36%)	3	17.5	-17.5
Voc Ed Other	10 (40%)	5	1.2	-1.2
Total	70 (38%)	4	14.6	-14.6

Criticism of conduct was presented in the same number of classrooms as was remediation (70), but somewhat less frequently per class (3 versus 4 occurrences per class session). Criticism data are presented in Table 10. Again, most interactions were directed toward males, except in Agriculture. The criticism interactions directed toward females in Agriculture was the only instance in which females were the target of the majority of interactions, and this occurred for a negative interaction.

Table 10

Teacher Criticism of Conduct by Program Area

Voc Ed Area	Number of Classrooms	Mean Criticism of Conduct Interactions per Classroom	Coeff. of Dist. Male %	Coeff. of Dist. Female %
Home Ec	14 (35%)	2	38.7	-38.7
Agriculture	11 (42%)	3	-21.7	21.7
Business	37 (41%)	3	21.7	-21.7
Voc Ed Other	8 (32%)	2	12.8	-12.8
Total	70 (38%)	3	17.3	-17.3

SUMMARY

The results of previous research designed to investigate classroom interaction patterns have consistently pointed up the fact that males received a disproportionate amount of attention from the teacher. However, no data were available which described interactions in Vocational Education classes. The purpose of this research was to identify the pattern of interactions in a sample of vocational classes in Kentucky's secondary schools and compare these findings to other studies to ascertain whether or not these classes displayed the sex bias observed in previous research. This summary will center mainly on interactions dealing with academic work; there were too few conduct interactions to warrant interpretation.

From the Office of Vocational Education and teacher preparation point of view, the desired results would reveal no sex bias, i.e., there would be a proportionate number of interactions for either sex. Unfortunately, this was not the case. The results of this study were consistent with previous research at the secondary level. A larger proportion of interactions was consistently directed toward males. Thus, the answer to Research Question One was YES, differences do exist in the interaction levels between secondary vocational education teachers and the male and female students in their classrooms.

Another finding which was disturbingly similar to previous research was that the teachers gave very little praise to their students. Most did, however, reach a fairly high level of Acceptance interactions, particularly with regard to the students academic work.

On a more positive note, criticism occurred even less frequently than praise.

Research Question Two was designed to investigate in which types of interactions are differences found between males and females. The answer was, "for all categories of interactions." The differences were, however, more pronounced for Praise and Criticism. Females received less praise, but they also received less criticism. The smallest difference between the genders was for Remediation.

The Third Research Question looked at differences in interaction patterns by gender and by program area. Concerning Praise of academic work, Agriculture stood out with 20.7 percent more male praise interactions than would be expected, followed by Home Economics with 8.7 percent. The gender differences were much smaller for Business and Other Vocational. Acceptance interactions were the most prevalent, regardless of program area. The program areas were also quite close in their Remediation interactions. The least amount of variation occurred here. Home Economics displayed the least degree of sex bias in Criticism interactions (4.2%). The other areas ranged from 11.0 to 17.7 percent.

All-in-all, one must conclude that our vocational teachers displayed behaviors similar to elementary/secondary academic teachers. They praised and criticized very little; they accepted and remediated a great deal; and most of their interaction behaviors were directed toward male students.

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APPENDIX A

Correspondence with Local Schools

Kentucky Department of Education

Alice McDonald, Superintendent of Public Instruction
Capital Plaza Tower, Frankfort, Kentucky 40601

November 11, 1987

Mr.
Superintendent
Board of Education

KY

Dear Mr.

The Kentucky Department of Education, through a grant to the University of Kentucky, is sponsoring a rather ambitious research project this school year designed to assess the teacher-student interaction patterns in Vocational Education classrooms. Your district was randomly selected for participation in this study. I hope you will agree to participate; we will be calling you within the next week or two to verify your decision and to answer any questions you might have relative to what would be involved in the project.

Basically, this will be a descriptive study which will involve three one-period observations of selected classrooms. There will be no manipulation of instruction, no evaluation of your teachers, and no classroom participation by the observer. The people who have been trained to observe will simply sit in on the class and record interaction patterns of students and teachers. There is no "good" score or "bad" score. We only wish to establish some baseline data from 19 other schools. Individual classroom data will be anonymous; the data from the 20 participating schools will be analyzed together.

Similar research has been conducted in elementary/secondary schools and in higher education. But, no such data exist for vocational programs.

I hope you agree to work with us on this most important project. Be assured, we will keep any interruptions to a minimum, including pre-scheduling all classroom observations. We would only need your school's cooperation in identifying classrooms with a mix of male and female students, the sex of the teacher, and help in scheduling the visits to your school.

Thank you for your consideration of our request. Dr. Clayton Omvig, Chairman, Department of Vocational Education, University of Kentucky, will be contacting you in the near future.

Sincerely,

Ann S. Bardwell, Ph.D.
Associate Superintendent
Office of Vocational Education

ASB/pgs

When our schools work, Kentucky works.

UNIVERSITY OF KENTUCKY
LEXINGTON, KENTUCKY 40506-0017

COLLEGE OF EDUCATION
VOCATIONAL EDUCATION
AG DIGBY HALL

February 2, 1988

Principal

Dear Mr.

Enclosed please find a list of the classrooms which have been selected to participate in the Classroom Interaction Project. Also enclosed is a letter to each participating teacher.

We are pleased that your school is among those schools working with us. Be assured, we will make every effort to keep any disturbance or extra work to a minimum. I hope that the biggest problem any of us will face will be arranging for the first visit.

As indicated in my letter to the teachers and in Dr. Bardwell's letter to your superintendent, we merely wish to establish a data base relative to the operation of co-educational classes in vocational education. An individual trained in classroom observation techniques will arrange to visit each teacher's class on three occasions between now and mid-April. Student/teacher interactions will be recorded only. There will be no evaluation of any kind and there is no preconceived notion of how teachers and students should or should not react in a co-ed setting. This will be strictly a descriptive data gathering effort. Data from about 60 classes from across the state will be combined for analysis. No individual teacher/classroom data will be identifiable.

To cut down on travel expenses and time, we hope to visit several classes in your school during each visit. We realize that the scheduling will cause some problems. We are open to any suggestions on how best to accomplish this. Also, how ever you want us to proceed is how it will be done in your school.

We sincerely thank you for your help. Copies of the research report will be made available to cooperating schools by the State Office of Vocational Education.

If you have any questions, please call (606-257-5997).

Sincerely,

Clayton P. Omvig, Chairman
Department of Vocational Education

acm/

PARTICIPATING TEACHERS

CLASSROOM INTERACTION PROJECT

_____
(School)

Time/Period	Teacher	Course Title
___ - ___ 1	_____	_____
___ - ___ 2	_____	_____
___ - ___ 3	_____	_____
___ - ___ 4	_____	_____
___ - ___ 5	_____	_____
___ - ___ 6	_____	_____
___ - ___ 7	_____	_____

Classroom Interaction Project
Department of Vocational Education
51 Dickey Hall
University of Kentucky
Lexington, Kentucky 40506-0017

UNIVERSITY OF KENTUCKY

LEXINGTON, KENTUCKY 40506-0017

COLLEGE OF EDUCATION
VOCATIONAL EDUCATION
43 DICKEY HALL

February 2, 1988

Dear Mr.

As I'm sure you are aware from conversation with school officials and your completing the form identifying classes taught and the male/female mix of those classes, your school (and more specifically, one of your classes) has been selected to participate in a Kentucky Office of Vocational Education sponsored research project. This project is designed to provide a data base relative to the operation of co-educational classes in Vocational Education.

Having both boys and girls represented in the same classes is not new to Vocational Education, but the frequency of mixed classes is much greater now than in the past. All we wish to do for this project is to visit one of your co-educational classes three times between now and mid-April. An individual trained in classroom observation techniques will merely arrange for and visit your class and those of selected colleagues. His/her observation will consist of recording student and teacher interactions during the class period. There will be no evaluations of any kind and there is no preconceived notion of how teachers and students should or should not react in a co-ed setting. This will be strictly a descriptive data gathering effort. Data from your class will be combined with data from about 60 other classes for analysis. No individual teacher/classroom will be identifiable.

We hope that this will be a relatively painless effort for you, but it will be a logistical nightmare for us in arranging for the many visits, in that test days, field trips, visiting speakers, etc., will need to be avoided. Also, to cut down on travel and time, it would be desirable to observe three or more teacher's classes in your school during each visit.

The attached sheet more fully describes the project and your responsibilities to it.

Thank you for your participation. If you have any questions, call collect (606-257-5997).

Sincerely,

Clayton P. Omvig, Chairman
Department of Vocational Education

acm/

TEACHER INFORMATION SHEET

CLASSROOM INTERACTION PROJECT

Purpose of the Project:

To collect baseline data relative to the operation of co-educational classes in vocational education. There currently exists a body of knowledge relative to student/teacher interaction in general education settings and in sexually segregated classes. However, no such data exist for vocational education. The purpose of this study will be to provide such a data base.

Your Responsibility as a Cooperating Teacher:

1. Allow an individual trained in classroom observation techniques to visit your class three times.
2. Provide this individual with a chair in the rear of the room.
3. Teach your class as usual.
4. Provide some demographic data, such as: age, years, teaching experience, degrees held, etc.

As I indicated in the attached letter, this is in no way an evaluation. No individual classroom data will be analyzed.

Responsibilities of the Classroom Observer:

1. Merely record classroom activities on a predesigned form.
2. Make no judgments, no interruptions, no comments.
3. Try his/her best not to be a distraction to the normal classroom routine.

APPENDIX B

INTERSECT Observation Instruments

TEACHER DATA SHEET

Classroom Interaction Project

1. _____ (Name) 2. _____ (School)

3. _____ years teaching experience (count this year)

4. Education: (Check one and complete as necessary)

_____ BA/BS (Rank III)
_____ BA/BS + _____
_____ MA/MS (Rank II)
_____ MA/MS + _____
_____ Rank I
_____ Rank I + _____
_____ Specialist in Education
_____ Doctorate

5. Certification held besides your vocational teacher (if any)

_____ No other
_____ Instructional Supervisor
_____ Principal
_____ Counselor
_____ Other: _____

6. I would rate my business/industry work experience as:

_____ a. Minimal
_____ b. Adequate -- sufficient for that required for my vocational certification
_____ c. More than necessary for my certification
_____ d. Extensive -- four or more years

7. Have you ever had any special training in classroom interaction strategies: _____ Yes _____ No

If yes: Specify _____
_____

Thanks for your cooperation. I trust that your participation in the project has gone/will go well.

Observer	Date	School	Grade Level	# ID

Time _____ Subject/Teaching Context _____

1	2	3	4	5	6	7	8	9	10
Teacher Initiates to:	BY	Student Initiates	IN	Praise	Accept	Remediate	Criticize	Comment	Ancillary Teacher Behavior
M F ___ G R B W H A O	HAND MOVE CALL OUT	M F ___ G R B W H A O	Private	P-I P-C P-App^W P-O	A-I A-C A-App^W A-O	R-I R-C R-App^W R-O	C-I C-C C-App^W C-O		Attribution A Eff X Short Circuit: Physical Verbal
M F ___ G R B W H A O	HAND MOVE CALL OUT	M F ___ G R B W H A O	Private	P-I P-C P-App^W P-O	A-I A-C A-App^W A-O	R-I R-C R-App^W R-O	C-I C-C C-App^W C-O		Attribution A Eff X Short Circuit: Physical Verbal
M F ___ G R B W H A O	HAND MOVE CALL OUT	M F ___ G R B W H A O	Private	P-I P-C P-App^W P-O	A-I A-C A-App^W A-O	R-I R-C R-App^W R-O	C-I C-C C-App^W C-O		Attribution A Eff X Short Circuit: Physical Verbal
M F ___ G R B W H A O	HAND MOVE CALL OUT	M F ___ G R B W H A O	Private	P-I P-C P-App^W P-O	A-I A-C A-App^W A-O	R-I R-C R-App^W R-O	C-I C-C C-App^W C-O		Attribution A Eff X Short Circuit: Physical Verbal
M F ___ G R B W H A O	HAND MOVE CALL OUT	M F ___ G R B W H A O	Private	P-I P-C P-App^W P-O	A-I A-C A-App^W A-O	R-I R-C R-App^W R-O	C-I C-C C-App^W C-O		Attribution A Eff X Short Circuit: Physical Verbal
M F ___ G R B W H A O	HAND MOVE CALL OUT	M F ___ G R B W H A O	Private	P-I P-C P-App^W P-O	A-I A-C A-App^W A-O	R-I R-C R-App^W R-O	C-I C-C C-App^W C-O		Attribution A Eff X Short Circuit: Physical Verbal
M F ___ G R B W H A O	HAND MOVE CALL OUT	M F ___ G R B W H A O	Private	P-I P-C P-App^W P-O	A-I A-C A-App^W A-O	R-I R-C R-App^W R-O	C-I C-C C-App^W C-O		Attribution A Eff X Short Circuit: Physical Verbal
M F ___ G R B W H A O	HAND MOVE CALL OUT	M F ___ G R B W H A O	Private	P-I P-C P-App^W P-O	A-I A-C A-App^W A-O	R-I R-C R-App^W R-O	C-I C-C C-App^W C-O		Attribution A Eff X Short Circuit: Physical Verbal
M F ___ G R B W H A O	HAND MOVE CALL OUT	M F ___ G R B W H A O	Private	P-I P-C P-App^W P-O	A-I A-C A-App^W A-O	R-I R-C R-App^W R-O	C-I C-C C-App^W C-O		Attribution A Eff X Short Circuit: Physical Verbal

Observer	Date	Time of Entry	School	Grade Level	ID#

DIAGRAM OF CLASSROOM SEATING ARRANGEMENT

OBSERVATION TALLY SHEET

School_____ Class_____ Teacher___M or___F

Date of Observation_____

1. No. of interactions with MW students_____.
2. No. of interactions with MB students_____. Total of No. 1 & 2_____.
3. No. of interactions with FW students _____ .
4. No. of interactions with FB students _____ . Total of No. 3 & 4 _____.
5. No. of acceptance interactions _____.
6. No. of remediate interactions _____.
7. No. of praise interactions _____.
8. No. of criticism interactions _____ .
9. No. of student initiated interactions_____.
10. No. of conduct interactions_____.
11. No. of group interactions_____.
12. Other interactions:

_____

_____

_____

_____

Signature of Observer